

## Solid-State Hydrogen Storage

Completed Technology Project (2013 - 2014)



## Project Introduction

This project will develop a method for converting metals to metal hydrides at low pressures for hydrogen storage systems with high efficiency with respect to volume and weight.

Availability of a safe, low-pressure, lightweight, compact hydrogen storage system is an enabling technology for hydrogen electric fuel cell usage for space exploration and advanced aircraft electric propulsion systems. Titanium hydride is being used as a model material for proof of concept. Other hydrides with more hydrogen per unit mass will then be evaluated. Ultimately, nanostructured materials (such as carbon nanotube sheets) with potential to store large quantities of hydrogen in a very small volume will be explored.

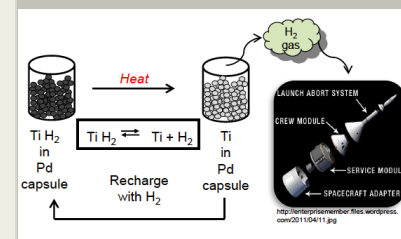
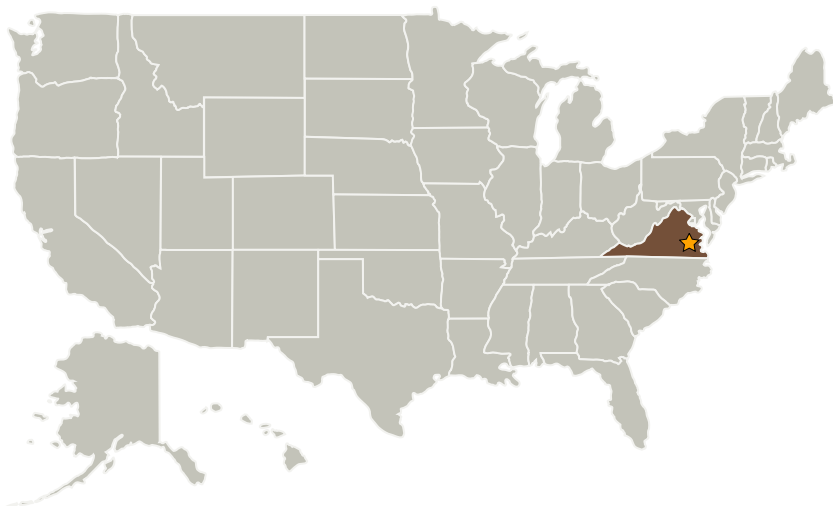
## Anticipated Benefits

Safe, compact, reusable system for storage of hydrogen for electric fuel cells for long-term space exploration missions.

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Safe, compact, reusable system for storage of hydrogen for fuel cells for long-term space exploration missions. Also can be used for ground-based fuel cells. Particularly beneficial for automobile electric fuel cells.

## Primary U.S. Work Locations and Key Partners



Project Image Solid-State Hydrogen Storage

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## Organizational Responsibility

## Responsible Mission Directorate:

Mission Support Directorate (MSD)

## Lead Center / Facility:

Langley Research Center (LaRC)

## Responsible Program:

Center Independent Research & Development: LaRC IRAD

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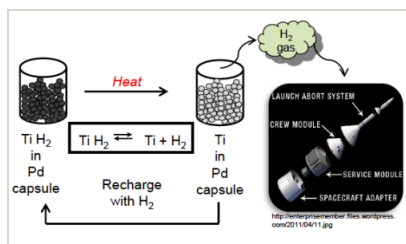


Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia

Co-Funding Partners	Type	Location
Norfolk State University(NSU)	Academia	Norfolk, Virginia

Primary U.S. Work Locations
Virginia

## Images

**12016-1378758487173.png**

Project Image Solid-State Hydrogen Storage

(https://techport.nasa.gov/image/2280)

## Project Management

**Program Manager:**

Julie A Williams-byrd

**Project Manager:**

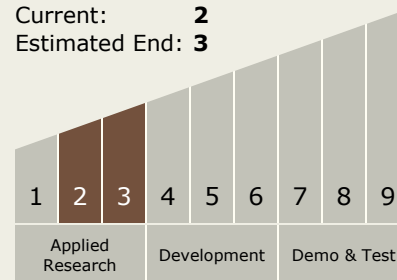
Richard K Bird

**Principal Investigator:**

Richard K Bird

## Technology Maturity (TRL)

Start: 2  
 Current: 2  
 Estimated End: 3



## Technology Areas

**Primary:**

- TX03 Aerospace Power and Energy Storage
  - TX03.2 Energy Storage
    - TX03.2.2 Electrochemical: Fuel Cells